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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

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09/743649

## TRANSMITTAL LETTER TO THE UNITED STATES

DESIGNATED/ELECTED OFFICE (DO/EO/US)

CONCERNING A FILING UNDER 35 U.S.C. 371

INTERNATIONAL APPLICATION NO.

PCT/US99/16381

INTERNATIONAL FILING DATE

20 July 1999 (20.07.99)

PRIORITY DATE CLAIMED

20 July 1998 (20.07.98)

## TITLE OF INVENTION

DIGITAL VIDEO APPARATUS USER INTERFACE

## APPLICANT(S) FOR DO/EO/US

Debbie Indira Lewis, Pratish Ratilal Desai; Robert Howard Miller

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ has been transmitted by the International Bureau.
  - c. ☒ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210). attached to Item 13
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

## Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98. with references attached
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. Return postcard receipt

20. ☒ ~~Other items or information:~~ **CERTIFICATE OF MAILING UNDER 37 CFR 1.10**

EL667108836US

January 12, 2001

"Express Mail" mailing no.

Date of Deposit

I hereby certify that this application is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

DAVIDA FORNAROTTO

Typed or printed name of person  
mailing application

*David F. Fornarotto*  
Signature of person mailing  
application

PCT/US99/16381

PCA 88650

JAN 2001

21. The following fees are submitted:

## BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... \$1000.00
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... \$860.00
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$710.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$690.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (c)). ☐ 20 ☐ 30

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total claims	11 - 20 =	0	x \$18.00
Independent claims	2 - 3 =	0	x \$80.00

Multiple Dependent Claims (check if applicable) ☐

TOTAL OF ABOVE CALCULATIONS =

860.00

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable). ☐

SUBTOTAL =

860.00

Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)). ☐ 20 ☐ 30

TOTAL NATIONAL FEE =

860.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). ☐

TOTAL FEES ENCLOSED =

860.00

Amount to be:

refunded

\$

charged

\$ 860.00

- ☐ A check in the amount of \_\_\_\_\_ to cover the above fees is enclosed.
- ☒ Please charge my Deposit Account No. 07-0832 in the amount of \$860.00 to cover the above fees. A duplicate copy of this sheet is enclosed.
- ☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 07-0832 A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Mr. Joseph S. Tripoli  
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SIGNATURE

Paul P. Kfel

NAME

40,677

REGISTRATION NUMBER

January 12, 2001

DATE

GENERATED

500 Rec'd PCT/PTO 12 JAN 2001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Debbie Indira Lewis; Pratish Ratilal Desai;  
Robert Howard Miller

Filed : Herewith

For : DIGITAL VIDEO APPARATUS USER INTERFACE

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Sir:

In the US national phase application of PCT/US99/16381 filed herewith, please enter the following amendments:

IN THE SPECIFICATION:

Please amend the specification as follows:

On Page 1, following the title, insert:

-- This application claims the benefit under 35 U.S.C. § 365 of International Application PCT/US99/16381, filed July 20, 1999, which claims the benefit of U.S. Provisional Application Serial No. 60/093,423, filed July 20, 1998.--

IN THE CLAIMS:

Please amend the claims (which are the annexes of the International Preliminary Examination Report) as follows:

1.(AMENDED) A method of controlling a system for processing stored information on a storage medium, comprising the steps of:

(A) playing back [(127)] stored information during a play mode of operation;

(B) providing [(134)] to a user, during play mode of operation, an opportunity to select a bookmark, representing a corresponding location within the stored information, from among a plurality of bookmarks responsive to user input; and

(C) changing [(138)] to playing back the stored information from the location corresponding to the selected bookmark during the play mode of operation, characterized in that step (B) includes

determining [(130)] the maximum number of the plurality of bookmarks which may be associated with the storage medium;

determining [(132)] which of the maximum number of the plurality of bookmarks are actually available for the storage medium;

generating [(134)] an on-screen menu [(110)] displaying the maximum number of the plurality of bookmarks available and the actually available ones of the plurality of bookmarks associated with the storage medium, the menu allowing the user to perform one of:

- (a) set a new bookmark;
- (b) select a bookmark and clearing the selected bookmark,
- (c) select a bookmark and play back the stored information from the location corresponding to the selected bookmark, and
- (d) undo a previously performed operation

while continuing to watch program information playback in a background portion of the video display.

2. (AMENDED) The method of claim 1, further [characterized by] comprising the steps of:

grouping the plurality of bookmarks into sets each having a predetermined number of bookmarks;

storing each group of bookmarks; and

providing to the user an opportunity to retrieve a desired set of bookmarks

3.(AMENDED) The method of claim 1, [characterized in that] wherein:

step (B) further comprises the step of providing to the user an opportunity to select a first and a second bookmark from among the plurality of bookmarks, and

step (C) further comprises the step of changing to playback the stored information from the location corresponding to the first selected bookmark to the location corresponding to the location of the second bookmark.

4. (AMENDED) The method of claim 3, [characterized in that] wherein step (C) further comprises the step of selectively continually repeating the playback of the stored information from the location corresponding to the first selected bookmark to the location corresponding to the location of the second bookmark, in response to user control.

5. (AMENDED) The method of claim 1, [characterized in that] wherein the storage medium is a DVD disk, and wherein:

the step of determining [(132)] the bookmarks actually present for the particular DVD disk comprises evaluating data related to the DVD disk in non-volatile memory in the disk player.

6. (AMENDED) The method of claim 1, [characterized in that] wherein step (B) is preceded by the step of determining [(144)] whether a mode of operation enabling user access to bookmarks during play mode of operation is enabled; and performing steps (B) and (C) only if the mode of operation user access to bookmarks during play mode of operation is enabled.

7. (AMENDED) The method of claim 1, [characterized in that] wherein the system comprises a DVD player and the storage medium comprises a DVD disk.

8. (AMENDED) The method of claim 7, [characterized in that] wherein the step of setting a new bookmark in response to a user command comprises storing data associated with a pause function, including the nearest NAV\_PACK address, in conformance with the DVD specification.

9. (AMENDED) The method of claim 8, [characterized in that] wherein the step of changing playback from a new bookmarked location comprises launching a user operative RESUME command, using a stored NAV\_PACK address, in conformance with the DVD specification.

10. (AMENDED) The method of claim 1, [characterized in that] wherein step (C) further comprises the steps of selecting a first and second bookmark and continually repeating playing back the stored information from the location corresponding to the first selected bookmark to location corresponding to the second selected bookmark.

11. (AMENDED) Apparatus for processing information stored on a storage medium, comprising:  
a data processing unit [(28,30)] for accessing and processing information stored on the storage medium during the play mode of operation of the apparatus;  
a user control device [(41)] for receiving user input;  
an on-screen display device [(34,35)] for generating on-screen displays; and

a controller [(40)], coupled to the data processing unit, the user control device, and the on-screen display device, for activating the play mode of operation, and providing to a user during the play mode of operation an opportunity to access previously stored bookmarks, [characterized in that] wherein

the controller determines [(130)] the maximum number of the plurality of bookmarks which may be associated with the storage medium, and which of the maximum number of the plurality of bookmarks are actually available [(132)] for the storage medium, and

the on-screen display unit generates [(134)] an on-screen menu [(110)] displaying the maximum number of the plurality of bookmarks available and the actually available ones of the plurality of bookmarks associated with the storage medium, the menu allowing the user to perform one of:

- (a) set a new bookmark;
  - (b) select a bookmark and clearing the selected bookmark,
  - (c) select a bookmark and playing back the stored information from the location corresponding to the selected bookmark, and
  - (d) allow the user to undo a previously performed operation
- while continuing to watch the information playback in a background portion of a video display.

#### IN THE ABSTRACT:

Please add the following Abstract.

-- A method of controlling a system for processing stored information on a storage medium includes the following steps. Stored information is played back during a play mode of operation. A user is provided an opportunity to select a bookmark representing a corresponding location within the stored information, from among a plurality of bookmarks, responsive to user input. Playback is changed to from the location corresponding to the selected bookmark during the play mode of operation. Apparatus for processing information stored on a storage medium includes playback circuitry for retrieving information from the storage medium during a play mode of operation. A user control device receives user input. Control circuitry selects a bookmark, corresponding to a location in the retrieved information from the storage medium, in response to the user input, and conditions the playback circuitry to retrieve information from the storage medium starting at the location corresponding to the selected one of a plurality of bookmarks during the play mode of operation. --

## REMARKS

The specification has been amended to include a reference to the priority applications.

The above amendments to the claims have been made to eliminate the multiple dependencies and to meet the requirements of the United States.

To meet the requirements of the United States, the Abstract (as originally filed in the PCT application) is added.

No fee is believed to have been incurred by virtue of this amendment. However if a fee is incurred on the basis of this amendment, please charge such fee against deposit account 07-0832

Respectfully submitted,  
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Pratish Ratilal Desai  
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January 12, 2001

DIGITAL VIDEO APPARATUS USER INTERFACE

The present invention relates to a user interface for a digital video apparatus, and in particular, a user interface for a digital video apparatus capable of  
5 processing data blocks having position information included therewith, wherein the digital video apparatus can navigate through the data blocks based on position related information.

Video signal processing systems that utilize storage media having digitally compressed video and audio information recorded thereon can give the user a  
10 vast number of options for controlling playback of a video title stored on such a media. One such system that is gaining rapid acceptance comprises a video disc player adapted to process information stored in accordance with the digital video disc (DVD) specification. The information on a DVD formatted disc is recorded as discrete packets of data, in accordance with the applicable video and audio data compression  
15 standards, wherein designated packets carry data associated with various data streams, such as alternative video angles, audio tracks, subpicture streams, etc. A disc player reading a DVD formatted disc may be controlled to display certain packets of data and skip over others. In this manner, the DVD system can be used to prevent unauthorized access to information on a particular disc as well as seamlessly provide multiple  
20 variations of a video title, such as multiple camera angles and story endings, in accordance with user commands.

Each data packet or designated block of data packets also carry control information specifying the location of the data packet or block of data packets on the disc. One useful aspect of including location information in the data is that a disc  
25 player can be controlled to start and/or stop playback from a designated location on the disc.

DVD formatted discs are generally authored to include one or more video titles, wherein each video title corresponds to a designated program unit such as a movie or a television episode. Each video title may in turn be divided into one or  
30 more part-of-title units, also called chapters, wherein each chapter corresponds to a predetermined portion of the video title.

To assist the user in navigating through a disc, a menu or a set of menus are authored onto a disc. A disc menu usually lists the available video titles and



ART 34 AMEND

09/743649

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a video title menu usually lists the available chapters on a particular video title. The menus are usually configured such that the user can begin playback from the starting point of a selected video title or chapter.

However, these menus do not allow the user to select an arbitrary point within a video title or chapter for starting playback. For example, a user may have a favorite point in the middle of video title or a chapter in which to start playback. The user also may wish to avoid the inconvenience of manipulating the fast forward or reverse commands to reach the precise point desired. The user may also have a plurality of such favorite points located throughout the disc or within a video title. It can be seen that locating each of the desired points during playback can quickly become cumbersome and annoying. Therefore, what is needed is a user interface, apparatus and method which allows the user to avoid the inconvenience of having to manipulate the various transport keys in order to locate and start playback from a selected location within a video title or chapter.

U.S. Pat. No. 5,063,547 discloses an apparatus for reproducing a user defined preferred selection program from data stored on a compact disc. The disclosed apparatus is adapted to identify a particular disc from the sub-code on the disc. A user identification may also be stored in the player. The user identification and the disc identification are combined to form one identification code that may be associated with a preferred selection program stored in the memory. The preferred selection program may comprise track number selections, time within a track number or absolute time. A display included in the apparatus provides an indication of the selected choice.

In accordance with principles of the present invention, a method of controlling a system for processing stored information on a storage medium includes the following steps. Stored information is played back during a play mode of operation. A user is provided an opportunity to select a bookmark, representing a corresponding location within the stored information, from among a plurality of bookmarks, responsive to user input. Playback is changed to the location corresponding to the selected bookmark during the play mode of

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operation. Apparatus for processing information stored on a storage medium includes playback circuitry for retrieving information from the storage medium during a play mode of operation. A user control device receives user input. Control circuitry selects a bookmark, corresponding to a location in the retrieved  
5 information from the storage medium, in response to the user input, and conditions the playback circuitry to retrieve information from the storage medium starting at the location corresponding to the selected one of a plurality of bookmarks during the play mode of operation.

The invention will be described with reference to the accompanying  
10 drawings, wherein:

Fig. 1 is a block diagram of a digital video disc player suitable for implementing the bookmark feature of the present invention;

Fig. 2 is a diagram of a data structure in accordance with the DVD specification;

Fig. 3 is a block diagram of a presentation structure in accordance with the DVD specification;

Fig. 4 is an on-screen display suitable for use with the bookmark feature of the present invention.;

Fig. 5 is a flowchart illustrating the steps for implementing the displaying and dynamically selecting among particular ones of a plurality of bookmarks on a DVD Player; and

Fig. 6 shows, in flowchart form, another embodiment of the method for implementing the displaying and dynamically selecting among particular ones of a plurality of bookmarks on a DVD Player in accordance with principles of the invention.

Although the exemplary embodiment is described with reference to a digital video apparatus adapted to read compressed video and audio data from a disc and to process the data in accordance with the DVD specification, it is to be understood that the present invention may be used in any digital video apparatus capable of processing digital video and audio data, wherein the data is stored or received in packetized form with location information included therewith such that the digital video apparatus can quickly locate a particular data block and begin playback from a selected location.

Fig. 1 is a block diagram showing the basic elements of an exemplary digital video disc player suitable for use in implementing the bookmark feature of the present invention. The construction and operation of these elements are known to one of ordinary skill in the art and will not be discussed in detail here. Disc player 24 comprises motor and pickup assembly 26 which, under the control of servo processor 29, spins the disc and reads the information stored thereon. Preamp 27 and DVD data processing unit 28 translate the electrical pulses from motor and pickup assembly 26 into digital data that can be further processed by digital audio/video decoder unit 30. DVD data processing unit 28 typically performs functions such as demodulation, error correction and descrambling of the raw data read from the disc so that the data is in a suitable format for decoder unit 30.

Decoder unit 30 receives the demodulated, error corrected and descrambled data, processes the data, and provides the appropriate video and audio signals to a display unit, such as a television set. Decoder unit 30 comprises data stream demultiplexer 32 which demultiplexes the data from data processing unit 28 into a plurality of separate data streams, including a video stream, an audio stream and a subpicture stream, and provides the data streams to their respective data decoders. Video decoder 31 receives the video stream and provides a video signal to mixer 33. Subpicture decoder 34 receives the subpicture stream and provides data to on-screen display (OSD) control 35 which provides OSD video signals to mixer 33. The combined video signal from mixer 33 is provided to NTSC/PAL encoder 42 which provides a video signal that conforms to the appropriate video signal standard to a video display device. Audio decoder 36 receives the audio streams from data stream demultiplexer 32 and provide the appropriate audio signals to an audio system.

- Microcontroller 40 controls the operation of disc player 24.
- Microcontroller 40 is coupled to user control device 41, which may comprise IR remote control devices, front panel buttons or the like, and translates data from user control device 41 to control the operation of the various elements of disc player 24 described above. Microcontroller 40 may include a memory or may be coupled to a memory for storing various tables that determine the presentation sequence of data retrieved from a disk. Typically, microcontroller 40 is also configured to control various access features of disc player 24 including, but not limited to, parental lock out, decryption of encrypted discs, dialing remote controllers to gain access to encrypted discs. Microcontroller 40 may be embodied in various forms, including, but not limited to, a dedicated integrated circuit, or a part of a decoder/controller unit.
- Microcontroller 40 may be comprised of one of a plurality of suitable controller units, including, but not limited to STI 5500, manufactured by SGS Thomson.

Fig. 2 illustrates the structure of the program data and control data stored on a disc in accordance with the DVD specification and suitable for use with disc player 24. The data structure is hierarchical, wherein each data block is divided up into component data blocks, which are further divided into smaller component data blocks. Each video title set, which corresponds to a designated program unit, for example, a movie or an episode of a television show, is comprised of video object sets, which comprises a plurality of video objects.

Each video object is comprised of a plurality of cells, which may be considered a data unit for presentation having a plurality of data unit types, such as video, audio, subpicture, etc, and corresponds to a program segment. Each cell is in turn comprised of a plurality of video object units (VOBUs). Each VOBUs is comprised of a navigation pack (NAV\_PACK) and a plurality of packs, which are subdivided into a plurality of packets. A VOBUs generally corresponds to an MPEG-2 Group of Pictures (GOP) with an associated control data structure, the NAV\_PACK. The NAV\_PACK of each VOBUs contains information such as sector addresses of VOBUs relative to the current one (both forwards and backwards in temporal presentation order), and the amount of elapsed time in cell presentation which corresponds to the current VOBUs.

Data stored in accordance with the DVD specification is also logically organized into a presentation structure in order to provide flexibility in the manner in which the data can be presented. Fig. 3 illustrates the presentation structure in accordance with the DVD specification and suitable for use with disc player 24. This presentation structure is overlaid onto the data structure of Fig. 2. At the base level, the presentation sequence is defined by programs (PGs) 96, each of which comprise a linked list of pointers to cells. A plurality of PGs 96 may be combined to form a program chain information (PGCI) 94, a plurality of which may in turn be combined to form program chain (PGC) 92.

During presentation of a video titles, disc player 24 selects the appropriate PGC for loading into a primary table, based on such criteria as the user selected title and parental rating preference. Thereafter, disc player 24 reads the data stored on the disc based on the linked list of pointers contained in the PGs. As is known, disc players generally utilize various look ahead algorithms in order to read the data from the disc and store the data on a system buffer prior to actual presentation in order to provide seamless presentation.

Different versions of a video title set, corresponding to different parental control ratings, may be provided by the disc author to enable disc player 24 to seamlessly branch between various scenes to provide multiple playback sequences for a particular video title set. The seamless branching is achieved by linking and displaying the desired cells, programs and program chains as desired.

As noted above, the present invention recognizes that annoyance and inconvenience may be caused if a user is forced to repeatedly manipulate the transport keys in order to find a particular scene in a video title. Therefore, the present invention provides a user interface, apparatus and method for allowing a user to select a plurality of bookmarks for a particular disc and start playback from a selected one of the bookmarks. An on-screen display 110 suitable for implementing the present user interface is shown in Fig. 4. Display 110 is shown on a portion of the display device while the video title continues to play in another portion of the display, such as the background. The user is able to select the options on display 110 as the video title playback continues.

Display 110 includes bar 112 having a plurality of buttons 113 for allowing the user to select a bookmark with which to begin playback, and bar 114 having a plurality of buttons 115 for setting and erasing bookmarks. Each button 115 has a corresponding button 113 positioned directly above it. A user can direct disc player 24 to go to a particular bookmark and begin playback from that point by selection the appropriate button 113. An item on display 110 may be selected using one of a plurality of conventionally known methods such as using cursor control keys on a remote control device or a keyboard to move a highlight or a cursor on the display. As shown in Fig. 4, display 110 allows the user to select up to 10 bookmarks for a particular disc.

Text display 116 provides user prompts to assist the user in navigating through display 110, and in particular, setting and erasing the bookmarks. Undone button 118 reverses the operation of the previous marking or unmarking function selected by the user. Done button 120 allows the user to exit from display 110.

The operation of the present user interface is as follows. Microcontroller 40 generates display 110 in response to a designated user input, for example, pressing a particular button in a remote control or selecting a particular button on an on screen display. The user selects the desired one of buttons 115 to set a bookmark or erase a bookmark. If the user selects one of buttons 115, text display 116 indicates that the user can set a bookmark by pressing the "OK" key on remote control device 41. Advantageously, display 110 may be arranged to allow the user to enter a text description of the bookmarked point so that when the user selects a button 115 at a later time, text display 116 displays the user entered text description

associated with that bookmark. If the user wishes to clear the bookmark, the user selects button 118. In order to jump back and begin playback from a particular bookmark, the user selects the appropriate button 113. The present user interface may be modified to require the user to press a confirmation key, such as an "OK" key, to begin playback from a selected bookmark.

In a further embodiment, disc player 24 may include a non-volatile storage device for storing a plurality of bookmarks. Display 110 may be modified to include an identification number of the bookmark set, wherein a user may call up a particular set of bookmarks associated with a specific disc. In this manner, a collection of bookmarks may be maintained and accessed by microcontroller 40 as required by the user.

Advantageously, the present bookmark feature is implemented on disk player 24 by utilizing the Resume function specified in the DVD specification. According to the DVD specification, when the user pauses the presentation of a program, disk player 24 stores in memory various data associated with the stopping point. The data includes, but is not limited to, the nearest NAV\_PACK address, the chapter number and the title number. When the user resumes play of the program, disk player 24 launches a user operation resume wherein disk player 24 retrieves the data associated with the stopping point, including the nearest NAV\_PACK address and restarts presentation at that NAV\_PACK address. In the present invention, when the user specifies a bookmark point, disk player 24 saves, in an auxiliary table, the data that would be saved if the user had specified a pause in the presentation. However, unlike a stop and start sequence, disk player 24 continues presentation of the program. Each time the user specifies a bookmark, the data associated with the bookmark is saved in a similar fashion. Subsequently, when the user specifies playback from a particular bookmark, disk player 24 retrieves the navigation information associated with that bookmark from the auxiliary table and launches the user operative resume to start presentation from the bookmarked point. In this manner, the present invention extends the resume function specified in the DVD specification.

In the illustrated embodiment, referring to Fig. 4, there are a total of 10 bookmarks allowed in a set for a particular disk conforming to the ten buttons on display 110 (buttons 113 and 115 of fig. 4). Respective sets of bookmarks are identified and stored by identification number for each bookmark set, wherein the user

may store and then retrieve a particular set of bookmarks associated with a specific disk. For example, a user can have a favorite part of a video in the middle of a chapter in the video and bookmark that portion. That is, the user may set a bookmark for that location and select that bookmark to begin playback of the video at the favorite part using the display of Fig. 4.

It is also possible to have a certain favorite part of a video that the user wants played over and over. Thus, the feature of saving two bookmarks and have continual playback between the two points is also a feature that the user can use. As described above, the user may set a bookmark for the starting location, and another bookmark for the ending location of the favorite part. The user may then specify that playback of the video begin at the first bookmark, and end at the second bookmark. This playback can, optionally, be continually repeated.

The bookmarks, and sets of bookmarks, may be stored in non-volatile memory so that bookmarks for a certain disk can be selected and saved with respect to the particular disk, and later retrieved when that disk is played again. The Undo button (button 118 of display 110 of fig. 4) allows the user to undo the previous operation of marking or unmarking a bookmark. Thus, an accidental marking or unmarking can be undone without having to re-navigate display menu 110.

A flowchart illustrating the steps for implementing the displaying and dynamically selecting among particular ones of a plurality of bookmarks on a DVD Player is shown in Figure 5. In step 127, disc player 24 waits for the user to send a PLAY command and upon receiving the PLAY command searches the disk player's non-volatile memory for a set of bookmarks for this particular disk. In step 128, the user accesses the bookmark functions. In step 130, disk player 24 determines all previously saved bookmarks with respect to the particular disk. In step 132, disk player 24 determines what bookmarks are available, i.e., those bookmarks not blocked with a parent block or those not disabled. In step 134, an on-screen display 110 is overlaid, in a known manner, onto the video and audio display generated by the disk player 24 displaying the allowable bookmarks, and allowing the user to set and clear bookmarks, as well as initiate play from available bookmarks, while continuing to watch the title playback in a background portion of the video display. The menu display distinguishes between those bookmarks present and available and those that are present and unavailable by not displaying the unavailable bookmarks on display 110.



The user, in step 136, can select and clear bookmarks (with 10 stored bookmarks maximum for the displayed set). Step 136 also implements the Undo feature that allows the user to undo the previous operation of marking or unmarking a bookmark in one keystroke. In step 137, the user can decide to exit the routine without  
5 switching to play one of a plurality of bookmarks. The menu display tracks the user changes of the available bookmarks that are set, cleared, or selected for play. In step 138, the disk player 24 begins playback at the selected bookmark. In step 140, after disk player 24 switches to and plays the new bookmark, the on-screen display 110 is no longer overlaid onto the video and audio display generated by the disk player 24  
10 and the video signal processing system returns to a normal display.

Figure 6 shows, in flowchart form, another embodiment of the method for implementing the displaying and dynamically selecting among particular ones of a plurality of bookmarks on a DVD Player in accordance with principles of the invention. Steps in Fig. 6 which are the same as those illustrated in Fig. 5 have the  
15 same reference number as in Fig. 5, operate in the same manner to the corresponding steps in Fig. 5 as described above, and will not be described again here. The arrangement depicted in Fig. 6 provides for selectively enabling the mode of operation in which user sets, clears and selects for playback one of a plurality of bookmarks during the playback mode of operation. Specifically, Fig. 6 includes step 144  
20 following step 128 which tests to determine if the access to bookmark functions is enabled. If the access to bookmark functions is disabled (A "NO" result at step 144), then step 144 is followed by step 142 which exits the routine without providing the user an opportunity to set, clear, or playback from the bookmark. In this case, changing the bookmark must occur prior to activation of the playback mode by  
25 navigating the usual setup menus as described above if a user desires. Otherwise, the user is given the opportunity to set and select from among the available bookmarks in the manner described above for Fig. 5.

It is herein recognized that the present bookmark feature may be implemented using any one of a number of conventionally known methods, or  
30 combination of methods, for controlling the operation of the elements of disc player 24 described above, for example by using embedded software in a microcontroller. Also, the present override feature may be implemented for any signal processing system which can be configured to selectively restrict display contents in response to parental

control ratings, or other program related information, included with stored audio, video and subpicture data, for example DVD-ROM systems, Laser Disc systems, etc. Therefore, it is to be understood that the present invention is intended to cover all modifications as would fall within the true scope and spirit of the present invention

5           It will be apparent to those skilled in the art that although the present invention has been described in terms of an exemplary embodiment, modifications and changes may be made to the disclosed embodiment without departing from the essence of the invention.

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ART 34 AMDT

## Claims

1. A method of controlling a system for processing stored information on a storage medium, comprising the steps of:

(A) playing back (127) stored information during a play mode of operation;

(B) providing (134) to a user, during play mode of operation, an opportunity to select a bookmark, representing a corresponding location within the stored information, from among a plurality of bookmarks responsive to user input; and

(C) changing (138) to playing back the stored information from the location corresponding to the selected bookmark during the play mode of operation, characterized in that step (B) includes

determining (130) the maximum number of the plurality of bookmarks which may be associated with the storage medium;

determining (132) which of the maximum number of the plurality of bookmarks are actually available for the storage medium;

generating (134) an on-screen menu (110) displaying the maximum number of the plurality of bookmarks available and the actually available ones of the plurality of bookmarks associated with the storage medium, the menu allowing the user to perform one of:

(a) set a new bookmark;

(b) select a bookmark and clearing the selected bookmark,

(c) select a bookmark and play back the stored information

from the location corresponding to the selected bookmark, and

(d) undo a previously performed operation

while continuing to watch program information playback in a background portion of the video display.

ART 34 AMDT

2. The method of claim 1, further characterized by the steps of:  
grouping the plurality of bookmarks into sets each having a predetermined  
number of bookmarks;

5 storing each group of bookmarks; and  
providing to the user an opportunity to retrieve a desired set of bookmarks

3. The method of claim 1, characterized in that:

10 step (B) further comprises the step of providing to the user an opportunity  
to select a first and a second bookmark from among the plurality of bookmarks,  
and

15 step (C) further comprises the step of changing to playback the stored  
information from the location corresponding to the first selected bookmark to the  
location corresponding to the location of the second bookmark.

20 4. The method of claim 3, characterized in that step (C) further comprises  
the step of selectively continually repeating the playback of the stored  
information from the location corresponding to the first selected bookmark to the  
location corresponding to the location of the second bookmark, in response to  
user control.

5. The method of claim 1, characterized in that the storage medium is a  
DVD disk, and wherein:

25 the step of determining (132) the bookmarks actually present for the  
particular DVD disk comprises evaluating data related to the DVD disk in non-  
volatile memory in the disk player.

30 6. The method of claim 1, characterized in that step (B) is preceded by  
the step of determining (144) whether a mode of operation enabling user access  
to bookmarks during play mode of operation is enabled; and

performing steps (B) and (C) only if the mode of operation user access to  
bookmarks during play mode of operation is enabled.

ART 34 AMDT

7. The method of claim 1, characterized in that the system comprises a DVD player and the storage medium comprises a DVD disk.

8. The method of claim 7, characterized in that the step of setting a new bookmark in response to a user command comprises storing data associated with a pause function, including the nearest NAV\_PACK address, in conformance with the DVD specification.

9. The method of claim 8, characterized in that the step of changing playback from a new bookmarked location comprises launching a user operative RESUME command, using a stored NAV\_PACK address, in conformance with the DVD specification.

10. The method of claim 1, characterized in that step (C) further comprises the steps of selecting a first and second bookmark and continually repeating playing back the stored information from the location corresponding to the first selected bookmark to location corresponding to the second selected bookmark.

11. Apparatus for processing information stored on a storage medium, comprising:

a data processing unit (28,30) for accessing and processing information stored on the storage medium during the play mode of operation of the apparatus;

a user control device (41) for receiving user input;  
an on-screen display device (34,35) for generating on-screen displays; and  
a controller (40), coupled to the data processing unit, the user control device, and the on-screen display device, for activating the play mode of operation, and providing to a user during the play mode of operation an opportunity to access previously stored bookmarks, characterized in that

the controller determines (130) the maximum number of the plurality of bookmarks which may be associated with the storage medium, and which of the maximum number of the plurality of bookmarks are actually available (132) for the storage medium, and

5 the on-screen display unit generates (134) an on-screen menu (110) displaying the maximum number of the plurality of bookmarks available and the actually available ones of the plurality of bookmarks associated with the storage medium, the menu allowing the user to perform one of:

- 10 (a) set a new bookmark;
- (b) select a bookmark and clearing the selected bookmark,
- (c) select a bookmark and playing back the stored information from the location corresponding to the selected bookmark, and
- (d) allow the user to undo a previously performed operation
- 15 while continuing to watch the information playback in a background portion of a video display.

FIG. 10 "CH954760"

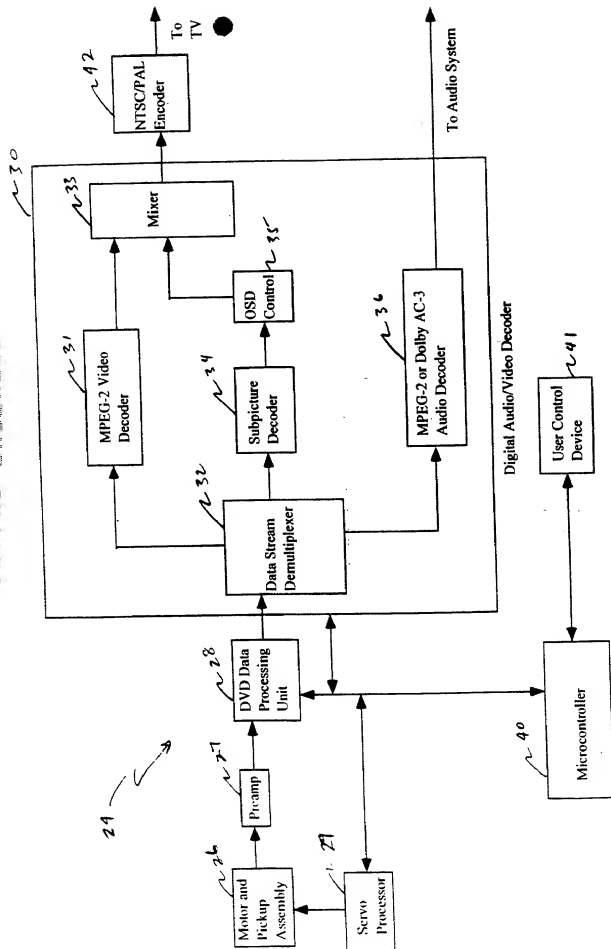


Fig. 1

2/6

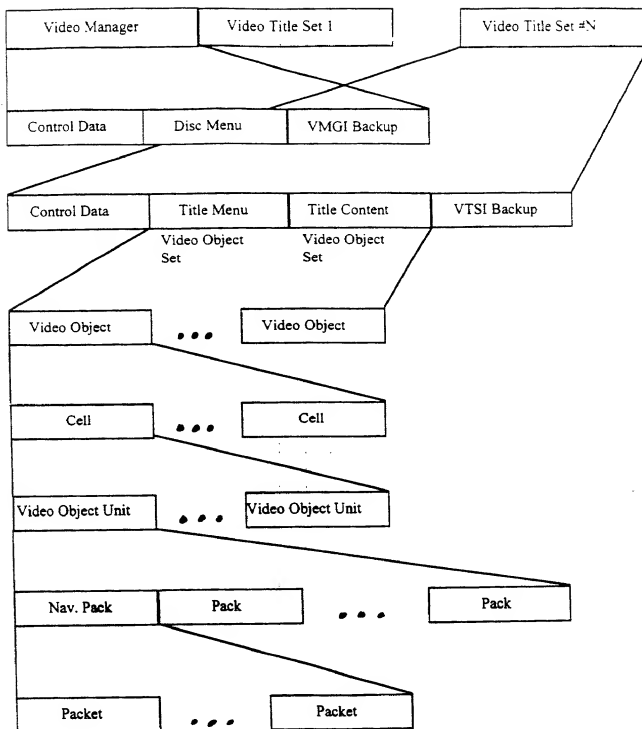


Fig. 2



3/6

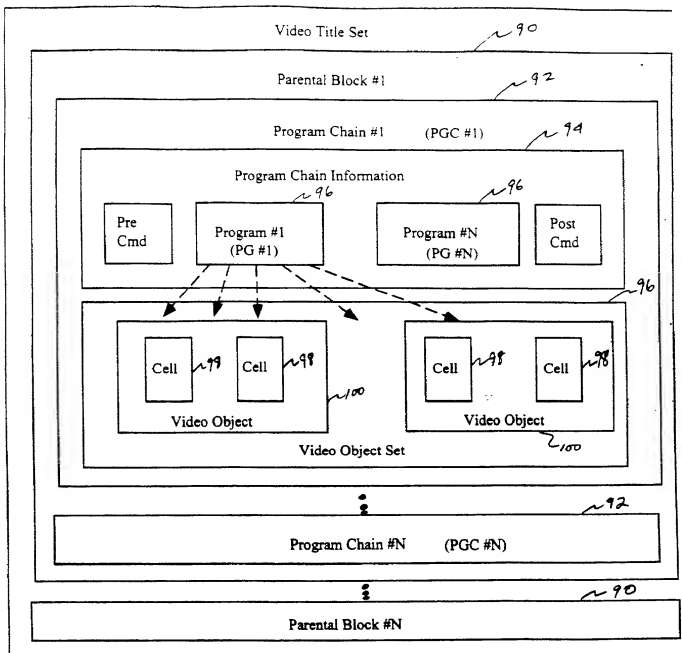


Fig. 3

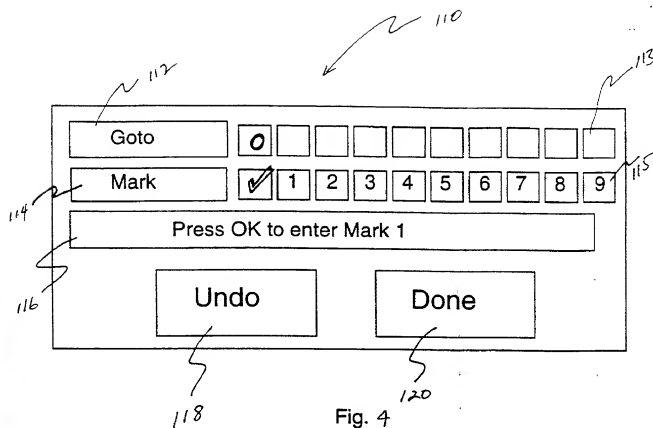
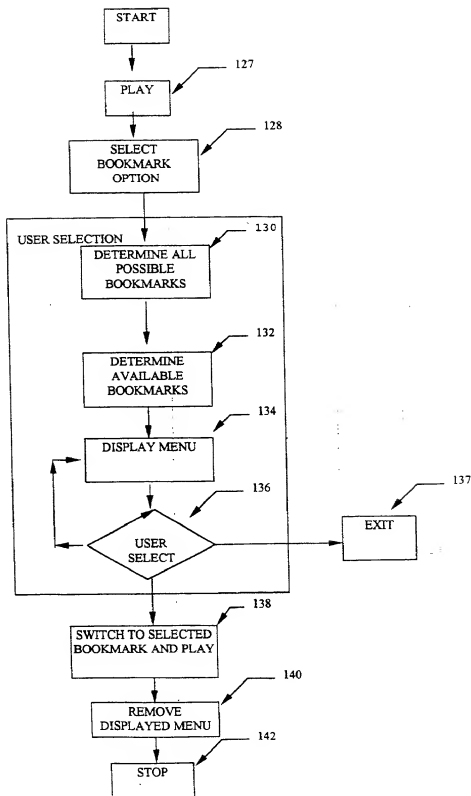


Fig. 4

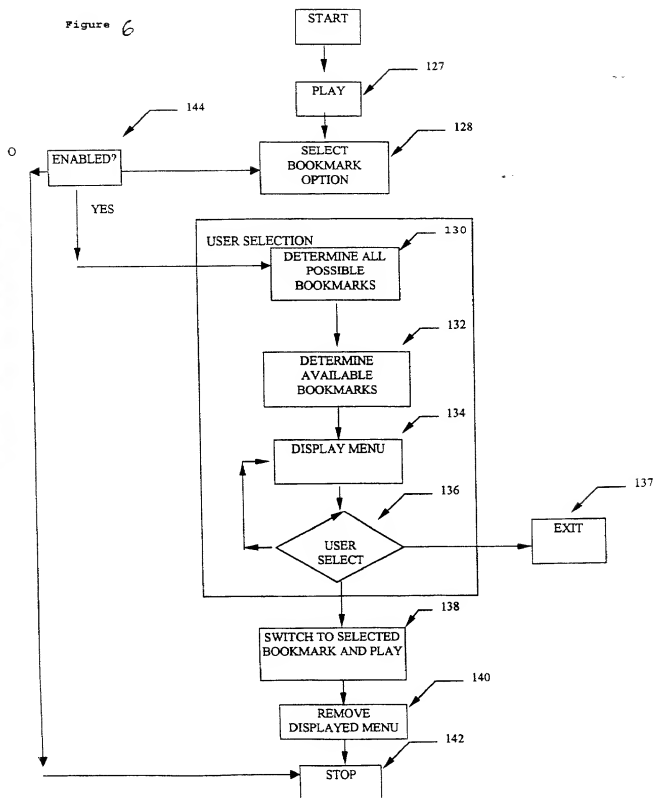
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Figure 5



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Figure 6



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	<b>First Named Inventor</b>	Debbie Indra Lewis
	<b>COMPLETE IF KNOWN</b>	
	<b>Application Number</b>	/
	<b>Filing Date</b>	
	<b>Group Art Unit</b>	
	<b>Examiner Name</b>	

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**DIGITAL VIDEO APPARATUS USER INTERFACE**

the specification of which (Title of the Invention)

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☒ was filed on (MM/DD/YYYY)

July 20, 1999 ✓

as United States Application Number or PCT International

Application Number **PCT/US99/16381** ✓ and was amended on (MM/DD/YYYY) **August 25, 2000** ✓ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above:

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Given Name (first and middle [if any]) <u>DEBBIE INDIRA</u>			Family Name or Surname <u>LEWIS</u>		
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Mailing Address					
City <u>Norcross</u>		State <u>GA</u>		ZIP <u>30092</u>	Country <u>US</u>
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Mailing Address <u>34778 Constock Common</u>					
Mailing Address					
City <u>Fremont</u>		State <u>CA</u>		ZIP <u>94555</u>	Country <u>US</u>
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Country US			
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(37 CFR 1.16(e)))

<b>Attorney Docket Number</b>	<b>RCA 88650</b>
<b>First Named Inventor</b>	<b>Debbie Indira Lewis</b>
<b>COMPLETE IF KNOWN</b>	
Application Number	/
Filing Date	
Group Art Unit	
Examiner Name	

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**DIGITAL VIDEO APPARATUS USER INTERFACE**

the specification of which (Title of the Invention)

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**July 20, 1999**

as United States Application Number or PCT International

Application Number **PCT/US99/16381** and was amended on (MM/DD/YYYY) **August 25, 2000** (if applicable).

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Mailing Address <u>615 Ivy Chase Lane</u>			
Mailing Address			
City <u>Norcross</u>	State <u>GA</u>	ZIP <u>30092</u>	Country <u>US</u>
NAME OF SECOND INVENTOR:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle (if any)) <u>PRATISH RATILAL</u>		Family Name or Surname	<u>DESAL</u>
Inventor's Signature <u>Pratish</u>		Date <u>2/5/2001</u>	
Residence: City <u>Fremont</u> <u>CA</u>	State <u>CA</u>	Country <u>US</u>	Citizenship <u>IN</u>
Mailing Address <u>34778 Comstock Common</u>			
Mailing Address			
City <u>Fremont</u>	State <u>CA</u>	ZIP <u>94555</u>	Country <u>US</u>
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Given Name (first and middle [if any])		Family Name or Surname	
ROBERT HOWARD		MILLER	
Inventor's Signature			Date
Residence: City	Leawood	State: KS	Country: US
Citizenship: US			
Mailing Address: 2900 West 93rd Street			
Mailing Address:			
City	Leawood	State: KS	ZIP: 66206-1811
Country: US			
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<b>Attorney Docket Number</b>	RCA 88650
<b>First Named Inventor</b>	Debbie Indra Lewis
<b>COMPLETE IF KNOWN</b>	
<b>Application Number</b>	/
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I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above:

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign	Foreign Filing Date	Priority	Certified Copy Attached?	
			YES	NO
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

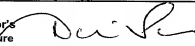
Application Number(s)	Filing Date (MM/DD/YYYY)	
<b>60/093,423</b>	<b>July 20, 1998</b>	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

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**DECLARATION — Utility or Design Patent Application**

Direct all correspondence to: <input type="checkbox"/> Customer Number or Bar Code Label <input type="text"/>		OR <input checked="" type="checkbox"/> Correspondence address below	
Name <u>JOSEPH S. TRIPOLI - PATENT OPERATIONS</u>			
Address <u>THOMSON multimedia Licensing Inc.</u>			
Address <u>PO Box 5312</u>			
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Country <u>US</u>	Telephone <u>609-734-9650</u>		Fax <u>1-609-734-9700</u>
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.			
NAME OF SOLE OR FIRST INVENTOR :		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any]) <u>DEBBIE INDIRA</u>		Family Name or Surname <u>LEWIS</u>	
Inventor's Signature 		Date <u>01/25/2001</u>	
Residence: City <u>NORCROSS</u> <u>GA.</u>	State <u>GA</u>	Country <u>US</u>	Citizenship <u>JAMAICA</u> ✓
Mailing Address <u>615 Ivy Chase Lane</u>			
Mailing Address			
City <u>Norcross</u>	State <u>GA</u>	ZIP <u>30092</u>	Country <u>US</u>
NAME OF SECOND INVENTOR:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any]) <u>PRATISH RATILAL</u>		Family Name or Surname <u>DESAI</u>	
Inventor's Signature		Date	
Residence: City <u>Fremont</u>	State <u>CA</u>	Country <u>US</u>	Citizenship <u>IN</u>
Mailing Address <u>34778 Comstock Common</u>			
Mailing Address			
City <u>Fremont</u>	State <u>CA</u>	ZIP <u>94555</u>	Country <u>US</u>
<input checked="" type="checkbox"/> Additional inventors are being named on <u>1</u> supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.			

Please type a plus sign (+) inside this box → +

PTO/SB/02A (11-00)

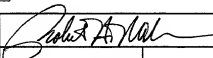
Approved for use through 10/31/2002. OMB 0651-0032

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## DECLARATION

**ADDITIONAL INVENTOR(S)**  
Supplemental Sheet  
Page 3 of 3

<b>Name of Additional Joint Inventor, if any:</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
ROBERT HOWARD		MILLER	
Inventor's Signature			Date 4-5-01
Residence: City	Leawood KS	State KS	Country US
Mailing Address		2900 West 93rd Street	
Mailing Address			
City	Leawood	State KS	ZIP 66206-1811
Country US			
<b>Name of Additional Joint Inventor, if any:</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Inventor's Signature			Date
Residence: City		State	Country
Mailing Address		Citizenship	
Mailing Address			
City		State	ZIP
Country			
<b>Name of Additional Joint Inventor, if any:</b>		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Inventor's Signature			Date
Residence: City		State	Country
Mailing Address		Citizenship	
Mailing Address			
City		State	ZIP
Country			

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